8 SELECTING A SURVEY DESIGN

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"Understanding how to properly conduct a survey has been critical to the successful implementation and analysis of my residency project. Even though this topic may seem straightforward, I have come to realize that it is much more complex than it initially appeared."

—PGY2 Ambulatory Care Resident

LEARNING OBJECTIVES

- Describe key steps in survey planning, implementation, and dissemination.
- Identify strengths and weaknesses associated with different types of survey modalities.
- Define features of survey design that may impact IRB approval.
- Identify research questions suitable for using a survey design.
- Explain limitations and biases associated with survey designs.

INTRODUCTION

The definition of *survey research* is "the collection of information from a sample of individuals through their responses to questions."[1] Survey research can be used in both quantitative and qualitative research; the core element is that the data are measured using self-reporting. In other words, researchers ask their participants, often referred to as *respondents* in survey research, to report their own thoughts, feeling, and behaviors. The majority of survey research is nonexperimental. This research describes single variables (e.g., the proportion of a population with diabetes) or assesses the statistical relationship between variables (e.g., the relationship between access to healthcare and diabetes control). Surveys may also be experimental in that an independent variable can be manipulated to assess its effect on dependent variables.

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Surveys are a valuable tool to enhance understanding of the knowledge, behavior, and attitudes of a population.[2] Surveys that measure knowledge can be compared to "correct" answers as determined by the survey designers or an accepted scale. Surveys that assess behavior often rely on self-reported information and can be useful to understand how behaviors correlate with certain outcomes. Surveys designed to assess attitudes can gauge a respondent's feelings about topics and, thus, do not have correct answers or test a given hypothesis. For example, patient satisfaction surveys measure attitudes about recent experiences within a healthcare system. Surveys using self-reported data are inherently limited as respondents may be hesitant to admit to unfavorable behaviors (e.g., smoking, drug use, sexual behavior), or they may not recall important details (e.g., number of missed doses in the previous month). Although there is not a consistent standard, methods to assess validity of surveys that measure attitudes and preferences *do* exist. Additionally, surveying is a useful approach for gathering prospective data. Because resident projects frequently use surveys, the purpose of this chapter is to prepare you to engage in collecting and analyzing your own survey data.[2,3]

SURVEY PLANNING

Survey Objectives

When undertaking any research, especially survey research, it is important to start with a well-reasoned research question (see Chapter 1 for more detail on writing a research question and objectives). You may not fully understand the topic you want to survey potential respondents about, but that should not stop you from moving forward. Write down where you want the research to take you and consult the relevant literature, if needed. The objectives of a survey should be carefully crafted and guide the development of the questions ultimately included in the survey. This consistency between objectives and the survey instrument will ensure your research aims will be successfully achieved and provide evidence that supports or rejects your hypothesis. If hypothesis testing is not the focus of your research, well-written research questions will help identify explicitly what you are hoping to learn about the respondents.[3]

Sample Size and Response Rates

Surveys gather data from a sample of individuals who represent the target population of interest. Therefore, clearly identify the sample and make sure it approximates the target population as closely as possible and is selected appropriately. Outline the sample selection process in advance, and describe in detail the techniques used to recruit respondents into the study. The sample size needed depends on the underlying purpose of the survey—for example, are you trying to describe characteristics of the population or test for differences in specific characteristics within the survey population?[4] Although some of the approaches are described below, all sample size calculations are study specific. Getting help from an experienced mentor, a biostatistician at your institute of learning, or even some application of educational materials gleaned from the web are all strategies to help you estimate the sample size needed for your study.

You can use numerous approaches to sample from a population. Unless you are conducting a census, which aims to survey every available subject, you should start with a sampling frame. A *sampling frame* is that portion of a target population that will ultimately have access to the survey materials. A *convenience sample* is ideal for resident research projects where the survey is available to a group of respondents, and each individual chooses whether to participate. For example, a survey link posted on a website allows those who happen to browse the website to decide to opt in and participate in the survey. Although this approach is convenient, inexpensive, and requires minimal time and effort, statistical inference is generally not possible using this method and the potential for selecting a biased sample is high. Consequently, this is the least favorable method of